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ALCOHOL CONSUMPTION'S RELATION TO SOCIOECONOMIC STATUS IN ESTONIA

Bachelor Thesis

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This paper conforms to the requirements for a Bachelor thesis

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(signature of the supervisor)

Admitted for defence " "..... (date)

I have written this Bachelor thesis independently. Any ideas or data taken from other authors or other sources have been fully referenced

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Introduction

Over the last years there have been several economic and social changes in Estonia. Taxes have been increased to control consumptions. The country is trying different economic approaches in order to create ideologies of their citizens' well-being. Certain economic approaches, like alcohol taxation, are not only used to benefit people's health but to gather funds for the government. Starting from 2007, pure alcohol consumption has been decreasing slightly over the years ("Statistika", 2018). This does not mean that there still is not a high level of consumption. The research paper is important for the researcher as the high alcohol consumption leads to health problems, endangerment of others, increased crime rates and failures in life. In 2017, an Estonian student went missing after a night out and his friends, volunteers and police started a search but unfortunately, they found him dead because he did not manage to cope with himself (Einmann, 2017). This news reminded people of the dangers of overconsuming alcohol and raised interest about the topic to the author. "Preliminary statistics show that in 2017, 419 people died in Estonia due to alcohol-related illnesses" ("Esialgne statistika näitab alkoholisurmade vähenemist", 2018). The latter source also states that in 2016 there were 465 deaths. The number of mortalities might not seem large but an investigation executed by several health workers suggests that "alcohol should be a concern for public health in this region" (McKee et al., 2000) because of the alcohol related mortality. The investigation also helps society to understand whether there is a relation between alcohol consumption and socioeconomic status because nowadays, alcohol beverages are reachable for everyone.

The aim of this research paper is to bring out the relation between alcohol consumption and socioeconomic factors in Estonia. The socioeconomic factors like income, education, marital status, professional status and region of living are used and pure alcohol consumption is taken as

the base for the analysis. Whether people with higher socioeconomic status consume more alcohol or people with low socioeconomic status consume more?

In order to reach the aims and find out answers to the questions, the following research tasks have to be done:

- Describe the foundations of alcohol consumption pattern and socioeconomic factors
- Explain the relation of dependency between alcohol consumption and socioeconomic factors
- Analysis of alcohol consumption and socioeconomic factors
- Interpretation of relationships and recommendation for alcohol policy design in Estonia

In chapter 1.1 alcohol consumption's pattern is described in order to have an overview of the existing trends. It will give an overview of why alcohol is consumed, what are the externalities and gives an overview of socioeconomic factors and their possible relations to alcohol consumption. Chapter 1.2 will analyse previous studies in order to find the dependency between alcohol consumption and socioeconomic factors. Chapter 2.1 will explain how the data was collected and the method which will be used to analyse. Chapter 2.2 will analyse the findings from the model and make recommendations for further study and alcohol policy in Estonia, if necessary.

There are manifold researches which cover how much alcohol is consumed, what affects the consumption or what are the effects. For example, Orro et al. (2018) describe information only about the alcohol consumption levels but nothing is mentioned about the socioeconomic factors. Gmel et al. (2013) on the other hand mentions one aspect of socioeconomic status, income, but he groups different countries into world regions, so Estonia is not specified. This

research fulfils the research gap which concerns how alcohol consumption has a relation to socioeconomic status in Estonia.

In order to fulfil the research aim, regression models need to be created. The data for the conduction is already gathered by International Alliance for Responsible Drinking (IARD) and International Center for Alcohol Policies (ICAP). The data was collected in 2015-2016 from all the Baltic States. It incorporates information about medicine, economics, politics and several other fields. The data has all the necessary alcohol consumption and socioeconomic status factors. Statistics are created to have an overview of the variables. Ordinal regression model is created to find Odd Ratios between the variables. Crosstabs is created to find relationships between different alcohol consumption levels and different variables' groups. MANOVA shows the effects which different independent variables' groups have with alcohol consumption quantity.

Keywords used in this Bachelor Thesis: Alcohol consumption, Socioeconomic factors, Estonia, Ordinal regression model

1. Theory about alcohol consumption and socioeconomic factors

1.1 Alcohol consumption and socioeconomic factors

Alcohol has been around for centuries. Alcoholic drinks can have different tastes and different alcohol percentages in them. But alcohol is not only consumed for taste reasons. "Alcohol is a sedative and a depressant that affects the central nervous system" (Cherney & Jewell, 2016). Scott, Smith & Abbey (1993) bring out that two main reasons why people consume alcohol are to cope with stress and because of social influences. If a person is constantly stressed out then this could lead to frequent consumption. Alcohol is also considered

as a bridge to creating relations as "alcohol, but in particular drunkenness, were seen to facilitate socialising, and the creation and maintenance of group bonds" (Seaman & Ikegwuonu, 2010). Pryor & Howe (2018) found that people tend to follow social norms because they think that the things what other people do are good things and if the norms are not followed then negative consequences may occur. When people in the society see other people consuming alcohol then they think that it is normal and they also start consuming. This can result in higher consumption.

Environment starts shaping people already when they are young. Even underage people drink alcohol. It is found that "not only do youth in the majority of European countries report a higher prevalence of intoxication, they also are more likely to report intoxication before age 13" (Grube, 2005). Taite (2015) states that when young people see alcohol advertisements and like those then this is associated with alcohol consumption, even binge drinking. In manifold developed countries alcohol commercials are a frequent occurrence. In Estonia, Consumer Protection has set strict rules on how alcohol can be advertised. Two restrictions out of many are that advertisements cannot call on people to consume their products or create a perception that alcohol is a natural part of life ("Alkoholi reklaami juhend", 2019).

In 2018, Estonia made the alcohol taxation system stricter. Logically, increase in tax increases the prices of alcohol products which results in less consumption. This is not the case with Estonia. In Estonia, the annual pure alcohol consumption per capita increased by 0.1 litres to 10.3 litres (Orro et al., 2018). Sillamaa and Liiva (2018) bring out that with the increase of alcohol tax, Estonians' alcohol purchasing from Latvia increased by 2.5 times compared to the previous year as for example, case of beer in Estonia costs €19.39 but in Latvia the same case costs €8.99. In Latvia the beer is over two times cheaper. The latter authors also state that this resulted in the closing of 40 small convenience stores in Estonia. Estonian Institute of Economic

Research made a poll where 56% of people who are heavy drinkers told that they are going to buy alcohol from Latvia (Josing, 2018). When consumers from Estonia go to Latvia to buy alcohol then they will not buy just one bottle, but they will rather buy in bulk as then they do not have to visit Latvia again soon. Buying in bulk results in more drinking as alcohol is in hand's reach. When alcohol sits in the fridge then a person will more likely consume it rather than when there would not be alcohol in the fridge and the person would have to go to a store to purchase it. In this research the data is gathered before the excise duty increase which means that it specifically does not relate to the latest excise duty change.

Global alcohol market in 2015 was valued at 1344 billion US dollars and is expected to reach 1594 billion US dollars in the year 2022. ("Market value of alcoholic beverages, 2015/2022", n.d.). This conveys that alcohol consumption worldwide must increase. Businesses which deal with alcohol start to benefit more from it because their revenues will increase. Governments will also benefit in turn. When the overall alcohol consumption increases, then this means that governments start to collect larger excise duties from the businesses. Governments have to be smart and set their excise duties on an optimal level because otherwise, they might not collect as much. "Kas alkoholiaktsiis lõi riigieelarvesse 55miljonise augu?" (2018) states that according to Ministry of Finance the excise duty rise caused the Estonian government to lose about 23 million euros to border commerce.

Alcohol consumption does not just cause problems for the person who is consuming alcohol but it has external effects also. Greenfield et al. (2009) bring out that the externalities from alcohol consumption are family problems, assaults, accompanying intoxicated driver, vehicular accident, financial problems and vandalized property and these are caused by others' drinking. Family problems refer to when a drunken person causes domestic violence, does not

contribute to family's life or has issues which could lead to divorce. Assaults take place when a drunken person initiates a physical contact with another person. According to the latter authors, accompanying intoxicated driver is the largest occurring externality in USA. It takes place when a passenger is with a drunk driver. Uusen (n.d.) states that in Estonia, half of the vehicular accidents are caused by drunken drivers. The author also states that every 4 out of 5 drowning deaths have occurred because of drunken people. Financial problems refer to the impulsive personality when a person prefers to drink and not to think about his/her life consequences. This could lead to job problems or mishandling of their personal finances. Vandalized property is caused by the destruction of other individuals' or government's property.

High socioeconomic status of a person or a group is perceived as financially good and is "often measured as a combination of education, income and occupation" ("Socioeconomic Status", n.d.). The higher the values of these factors the higher the status. Education is usually measured by years of studying. In Estonia primary education is mandatory for everyone. After that, a person can decide whether to keep on studying or start working. In 2017, out of 223,600 different education students, only 46200 acquired higher education, 51,000 acquired secondary education and the rest, 126,400 acquired primary education ("Tasemehariduse omandajad hariduse liigi ja astme järgi, aasta", 2018). Higher levels of education are acquired by fewer people. This conveys that less people can receive a higher socioeconomic status from education perspective. Better education leads to the possibility of receiving a job which has better salaries. Based on 2018, "the average monthly gross wage was 1310 euros in Estonian companies, institutions and organizations" ("Keskmine brutokuupalk oli 2018. aastal 1310 eurot", 2019) . When a person receives gross salary more than 1310 euros then it is perceived as over the average and a higher socioeconomic status is attained. Income has also to do with the occupation

a person has. Prestigious placement on a career ladder means usually more responsibility and that leads to voluminous salaries. These three main factors in manifold cases seem to be related as education leads to a job where salary is earned and through experience a better occupation is acquired.

Gender, region of living, ethnicity and age is also taken into consideration in order to evaluate the relation between alcohol consumption and socioeconomic status. Genders are male and female. This is an important variable as their physiological characteristics are much different and this can have a strong effect on the outcome. Region of living shows whether a respondent is from urban or rural area. Urban areas have shops, bars, clubs and other places which offer alcohol, so this makes alcohol more reachable to people. Furthermore, as there are more places to buy alcohol from then there is also a large competition over the market share. This means that larger amount of brands and different kinds of alcohol products are offered which leads to more people's alcohol preferences being satisfied. When alcohol is very reachable then people do not tend to buy it in large quantities. People living in rural areas have less alcohol varieties and less places to buy alcohol. Ethnicity is also taken as a variable because few decades ago Estonia was still occupied by Soviet Union and many Russians lived there. When Soviet Union fell apart and Estonia re-established independence then part of the Russians chose to stay in the country. In 2017 the population in Estonia was 1,315,635 and out of those 904,639 were Estonians, 330,206 were Russians and the rest were from other countries ("Rahvaarv rahvuse järgi, 1. jaanuar, aasta", 2017). Different ethnicities have different drinking patterns, so this could be a strong determinant. World Health Organization recorded that in 2010, 51% of alcohol consumed by Russians were spirits ("Management of substance abuse - Russian Federation", 2014). On the other hand, Orro et al. (2018) recorded that in Estonia the dominant alcoholic beverage is beer.

Age is a variable which is used in a lot of researches because different generations have grown up in different situations and environments and so could be the drinking patterns. For example, baby boomers' generation lived a life where Soviet Union had just occupied Estonia and a lot of goods were hard to get and alcohol was one of them. Nowadays, Generation Z's situation has changed and alcohol is very easily reachable. So, life's toughness is one reason why age is a necessary variable. Age also plays a role in the volition as older people tend to have some health issues already and they do not want to drink alcoholic beverages as much.

When it comes to alcohol consumption then the men are expected to drink more than women because of their physiological differences. People living in the urban areas are expected to drink more as alcohol is more reachable to them. People with higher income are expected to consume more alcohol because they have more funds to do it. People with younger age are expected to drink more. Alcohol consumption with education can go different ways. One expectation would be that people with higher education will drink more as they have a higher job position. The other option is that people with lower education drink more because they might have more struggles in life which can lead to increased stress. This in turn leads to more consumption.

1.2. Overview of literature

Overview of previously conducted studies was made in order to get a better understanding of what methodologies are used, results they give, et cetera. 9 literatures were reviewed (see Table 1). The sources which are gathered analyse different countries around the world but most of them are focused on European countries. Ahlström, Bloomfield and Knibbe 2001 analyse The Czech Republic, Finland, France, Germany, Italy, The Netherlands, Scotland,

Sweden, and Switzerland. These countries are mainly in the middle or West Europe. McKee et al. (2000) focus on Baltic State countries which are Estonia, Latvia and Lithuania. These belong to the East Europe. Gmel et al. (2013) is one of the sources which analyses the whole world. The authors have divided the countries into region like African Region, Region of the Americas, Eastern Mediterranean Region, European Region, South East Asian Region and West Pacific Region. To some extent this is good as it provides regional patterns of alcohol consumption but does not have importance when it comes to focusing on specific countries. Orro et al. (2018) provide information and statistics about Estonia. This is a valuable source as this research is focusing on Estonia. Popova, Rehm, Patra and Zatonski (2007) analyse Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The authors focus their research on Eastern-European countries. Mäkelä et al. (2001) discuss Finland, Sweden, Norway and Denmark. The source focuses on the Nordic European countries. Murphy et al. (2012) analyse former Soviet Union countries which some are Eastern-European countries and others are Central Asian countries. Helasoja et al. (2007) focus on the Baltic States and Finland. Klumbiene et al. (2012) discuss only one Baltic country which is Lithuania. Four of the sources include Estonia which is provides this research with a lot of help. As manifold of these sources analyse European countries then this is also valuable but they analyse different regions and these can have different alcohol beverage choices and quantities.

Table 1

Overview of previous studies

Author(s)	Region	Year	Data	Focus
Ahlström, Bloomfield & Knibbe	The Czech Republic, Finland, France, Germany, Italy, The Netherlands, Scotland, Sweden, and Switzerland	2001	Late 1980's and early 1990's	Gender differences
McKee et al.	Estonia, Latvia and Lithuania	2000	1997	Socioeconomic differences because of premature death
Gmel et al.	World by regions	2013	2003-2005	Consumption patterns
Orro et al.	Estonia	2018	2017	Alcohol market, consumption and harms
Popova, Rehm, Patra & Zatonski	Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia	2007	2002	Consumption differences between countries
Mäkelä et al.	Finland, Sweden, Norway and Denmark	2001	1996-1997	Heavy drinking
Murphy et al.	former Soviet Union countries	2012	1991-2011	Social differences because of premature death
Helasoja et al.	Baltic States and Finland	2007	1994, 1996, 1998, 2000 and 2002	Sociodemographic differences
Kluumbiene et al.	Lithuania	2012	1994-2010	Social differences

Composed by the author based on Ahlström, Bloomfield & Knibbe, 2001, McKee et al., 2000, Gmel et al., 2013, Orro et al., 2018, Popova, Rehm, Patra & Zatonski 2007, Mäkelä et al., 2001, Murphy et al., 2012, Helasoja et al., 2007, Kluumbiene et al., 2012

Ahlström, Bloomfield & Knibbe (2001) research's main focus was to find gender differences in alcohol consumption taking into consideration socioeconomic factors. That

research is similar to this one as it also looks into the relation between socioeconomic factors and alcohol consumption but it does not analyse Estonia. The research gap is derived from that. McKee et al. (2000) had an objective to explore alcohol consumption because in that time there was high premature mortality rate associated with alcohol consumption in post-Soviet states. Murphy et al. (2012) reason for the research was also related to premature death because of alcohol consumption and the research analysed whether alcohol consumption has a relation with social factors. Helasoja et al. (2007) aim is finding the relation of sociodemographic factors to alcohol consumption. The latter research is a bit similar to this one as it involves some of the factors which are used in the relation finding. Gmel et al. (2013) analyse world's regions' alcohol consumption patterns. Orro et al. (2018) analyse alcohol market, consumption and harms. Popova, Rehm, Patra and Zatonski (2007) also look at alcohol consumption and compare it other European countries. Mäkelä et al. (2001) aim was to compare and analyse heavy drinking rather than just look at the alcohol consumption in general. Klumbiene et al. (2012) aim was to find relations of social differences to alcohol consumption.

Time plays an important role when it comes to the researches. The ones which have been conducted few decades ago might not play an important role because alcohol policies and norms are changing over time. Ahlström, Bloomfield & Knibbe (2001) collected their data in the late 1980's and early 1990's. This is the oldest source analysed. In that time the ways for gathering data were a bit primitive compared to nowadays. The surveys were gathered through face-to-face and phone interviews and mails. Nowadays, it is easier to conduct surveys, for example, through internet. Murphy et al. (2012) based their research on articles published from 1991-2011. They found 2313 articles and researches but after removing duplicates and the ones which did not quite fit with their research, they were left with 26. This is another aspect how time plays a big

role. Researchers use other researchers' analyses in their own work and this to some extent leads to repetition of the findings. Helasoja et al. (2007) collected their data in 1994, 1996, 1998, 2000 and 2002. They started collecting their data for Lithuania from 1996 and Latvia from 1998 because it was not accessible before. Nowadays data is more available and statistics is gathered more frequently and in more areas. Older researches had more trouble accessing or collecting data. On the other hand, Klumbiene et al. (2012) collected their data from 1994 to 2010 and they focused only on Lithuania. The latter authors already were able to access and gather their data about Lithuanian alcohol consumption starting from 1994 but Helasoja et al. (2007) were not able to do it. Mäkelä et al. (2001) collected the data from 1996 to 1997 and McKee et al. (2000) collected in 1997. Their data was collected at the same time and from countries which are located closely and have gone through a similar history. By comparing their findings it will give a good overview of how different countries consumed alcohol at the same time gap. Popova, Rehm, Patra and Zatonski (2007) gathered their data in 2002. Gmel et al. (2013) gathered their data from 2003 to 2005 and took an average from those years. Orro et al. (2018) based their analysis on the year 2017. They have gathered their data every year for approximately a decade now and in their analysis they compare current year to the previous years' results.

All the sources include alcohol consumption factor but their focuses and structures are different. Ahlström, Bloomfield & Knibbe (2001) measured alcohol consumption as grams of absolute alcohol per month. As in different countries there are different schooling systems then education was measured by years. Employment was classified into student, employed, unemployed and retired. Marital status was also classified into categories. The age was ranged from 18 to 75 years but most of the people who were surveyed were aged 32 to 43 years old. McKee et al. (2000) measured education not as years of studying but as groups – people who

have finished primary education, people who have finished secondary education and people with higher education. Income was divided into four groups based on the national criteria. Authors used STATA to analyse the data. The alcohol consumption's relation with socioeconomic factors was calculated using multiple logistic regression analyses, adjusting for all variables simultaneously. Gmel et al. (2013) start with the consideration of recorded and unrecorded consumption, and beverage-specific consumption. The journal mainly focuses on the health issues, so it classifies drinking into groups – lifetime abstention, 12 month abstention, heavy episodic drinking, former drinkers and overall Adult per capita consumption (APC). In the later research, authors compare these groups with gender, age and income. Lastly, alcohol trends are explored, how much the consumption of a specific alcohol has increased, decreased or been stable. Orro et al. (2018) made several tables for alcohol consumption. For example, litre per capita in 100% alcohol, litre per capita, litres per capita aged 15 and over, and many more. These help to understand what types of alcohol beverages and how much are consumed but does not show relations to socioeconomic standards. Popova, Rehm, Patra and Zatonski (2007) aim was to find out how much and what alcohol each country consumes as alcohol harms people's health badly. The research's main inputs were per capita consumption and main beverage consumption in litres. Socioeconomic factors besides gender were not taken into account. Mäkelä et al. (2001) sample was aged from 19 to 71. They found out how frequently a person gets intoxicated, what and how frequently negative consequences take place, what is the annual consumption and how much is consumed per one occasion. The authors used mean to calculate the results and because in some cases there was random variation then regression models were applied. Between men and women the authors found annual intoxication frequency, annual frequency of 6+ drinks, consequence index (which mainly meant hangover) and the averages of these. Murphy et al.

(2012) looked for factors like demographic, socioeconomic, psychosocial and contextual from MEDLINE, EMBASE and Global Health databases. Helasoja et al. (2007) structured their research so that in Estonia, Lithuania and Finland education was measured as years but in Latvia it was measured according to four standard educational levels. As it can be seen then when analysing education in different countries then a specific standard needs to be set in order to compare because every country has different educational systems. Klumbiene et al. (2012) used variables like age, education, place of residence and marital status. Then latter variables were analysed with type of alcoholic beverage, consumption frequency and consumption amount. Consumption amount was found by converting the amount of glasses the observant had drank into pure alcohol.

The studies found relations between alcohol consumption and factors like age, gender, marital status, ethnicity, region of living, education, employment, income and parenthood. Ahlström, Bloomfield & Knibbe (2001)**,** McKee et al. (2000), Mäkelä et al. (2001), Murphy et al. (2012) and Helasoja et al. (2007) found that younger people tend to drink more (see Table 2). This means that younger people are more likely to drink heavily. As the age increases then the possibility of a person being a heavy drinker decreases. This is to do with the fact that younger people are more energetic. They go out more and explore. Older people tend to have families and they do not have the energy or time to drink as much. Old people have a higher chance of developing illnesses or some health problems which also decrease their interest of drinking. Helasoja et al. (2007) found that young women tend to binge drink. This means that with one occasion they tend to increase their blood alcohol concentration over 0.8 grams percent or more. Kluumbiene et al. (2012) found that young women tend drink frequently beer or wine. All of the sources state that as age increases then the alcohol consumption level decrease.

Table 2

Methods and results of previous studies

Author(s)	Methodology	Results
Ahlström, Bloomfield & Knibbe	Parallel analyses of the data already collected	Age is mostly related; women with higher education -> higher consumption; divorced men drank the most
McKee et al.	Multiple logistic regressions, adjusting for all variables simultaneously.	Higher education -> higher consumption; men tend to consume more frequently
Gmel et al.	Correlations and means were found	Men consume more than women; HIC have higher APC
Orro et al.	Pure statistics; frequency and percentage distribution	Beer is the most consumed alcoholic beverage in Estonia.
Popova, Rehm, Patra & Zatonski	Nominal scales; frequency and percentage distribution	Beer is the most popular drink; heavy drinking occurs mostly in Czech Republic
Mäkelä et al.	Frequency distribution; means and regression models	High intoxication and frequency in Finland; Denmark consumes most
Murphy et al.	Frequency distribution	Overall, there was a high level and frequent consumption of alcohol in fSU.
Helasoja et al.	Regression models	Heavy drinking in Finland and urban areas
Kluumbiene et al.	Regression models and correlations	Alcohol consumption increase

Composed by the author based on Ahlström, Bloomfield & Knibbe, 2001, McKee et al., 2000, Gmel et al., 2013, Orro et al., 2018, Popova, Rehm, Patra & Zatonski 2007, Mäkelä et al., 2001, Murphy et al., 2012, Helasoja et al., 2007, Kluumbiene et al., 2012

Some of the sources found that gender is necessary to be analysed separately because it is a too strong determinant. Men and female are physiologically different and it affects their drinking patterns. Gmel et al. (2013) and Murphy et al. (2012) stated that men drink more than women. One of the reasons why men drink more than women is that they are larger in size. Men's bodies can tolerate alcohol more. So, to get the same blood alcohol concentration then

men have to drink more. Murphy et al. (2012) also found that men have a tendency to drink in a harmful way.

Marital status dictates how much a person drinks. Ahlström, Bloomfield & Knibbe (2001) and Helasoja et al. (2007) state that divorced or not married men drink more than married men. A single or a divorced man might use alcohol in order to help his ability to socialize and perhaps find a future companion. On the other hand, living without a significant other does not always mean that people drink more. Murphy et al. (2012) found that people who are widowed do not drink much. He also stated that married women are more likely to drink responsibly.

The opposite of responsible drinking is heavy drinking. Helasoja et al. (2007) found that in most of the countries analysed, heavy drinking took place among the better educated. Ahlström, Bloomfield & Knibbe (2001) and Kluumbiene et al. (2012) stated that only women with higher education tend to drink more. Helasoja et al. (2007) also found that despite highly educated women drinking heavily, less-educated women tend to binge drink more. Per contra, McKee et al. (2000) and Murphy et al. (2012) discovered that men who are highly educated drink heavily, not women. Helasoja et al. (2007) shared the fact that men with lower education binge drink more. These contradictions rise from the fact that these sources have analysed different countries and cultures. People in different countries and cultures could easily have opposing customs.

Region of living plays a role in alcohol consumption because accessibility life styles. Helasoja et al. (2007) conveys that people living in urban areas drink heavily. This could have to do with the fact that alcohol products are more reachable in that area. In rural areas there are fewer shops or night locals from where to buy and consume the beverages. Gmel et al. (2013) brings out that lower consumption exists in low-income countries (LIC). People living in LIC

tend to focus their finance on the physiological part of the Maslow pyramid. The physiological level is about biological needs like food, water, sleep, air, shelter, clothing and reproduction (Gawel, J. E., 1997). Gmel et al. (2013) also conveyed that Islamic regions also show lower alcohol consumptions. This has to do with cultural and religious beliefs. It is not in their customs to drink much. Some do not drink at all.

As previously brought out then stress is one of reasons why people drink and this can be caused by unemployment. Ahlström, Bloomfield & Knibbe (2001) found that unemployment has a stronger relation with women drinking more rather than men. Per contra, Murphy et al. (2012) states that unemployed men drink alcohol frequently, in large quantities and end up creating health or other problems in their lives. Alcohol is a substance that helps to cope with many feelings. When a person wants to enjoy time then alcohol helps to have a better time. When a person is feeling down then alcohol increases the level of sorrow. A lot of these unemployed men drink because they are feeling down and end up having alcoholism.

Out of the 9 sources and many more searched, Ahlström, Bloomfield & Knibbe (2001) is the only one which states a relation between parenthood and alcohol consumption. The study found that females with children have a tendency to drink heavily. Laborde and Mair (2011) bring out that mostly, having a child keeps the mother from drinking and their research uncovers that mothers showed higher signs of drinking when they were not married or had higher income.

Income is a source with what people can purchase goods and services. A higher income would mean that people are able to buy more goods and services and lower income would mean that they can buy less. Gmel et al. (2013) found that people in high-income countries (HIC) drink more alcohol and have lower abstention rates than compared to LIC or medium-income countries (MIC). In HIC the economy is doing better and it is easier to acquire alcohol. In addition, LIC

have to worry about physiological needs but HIC do not need to worry about them as much. On the other hand, Murphy et al. (2012) stated that men with low income tend to drink more than men with high income. McKee et al. (2000) supports the fact that higher income is associated with larger consumption as the study found that in women, alcohol consumption increases as the income increases.

As brought out earlier, ethnicity can be a strong determinant. Both McKee et al. (2000) and Murphy et al. (2012) had Estonia as one of their subject to analyse and they took ethnicity as one of the variables. They found that Russians in Estonia do not drink as much as Estonians in Estonia. Both authors brought out the fact that Estonia compared to other countries they studied, has high levels of alcohol consumption among their citizens. This could little bit have to do with the fact that Estonia has been occupied manifold times throughout the history and relates to the past experience why people drink.

Manifold alcoholic beverages exist and when it comes to researches, they are categorized as beer, wine and spirits. McKee et al. (2000), Gmel et al. (2013), Orro et al. (2018) and Popova, Rehm, Patra and Zatonski (2007) found that beer is the most consumed alcoholic beverage. It is followed by spirits and then wine. This yet again depends on the countries which the studies are based upon. All of the countries studied are Eastern-Europe or Nordic countries. In Mediterranean region, beer is still the most common beverage but in some cases it is followed by wine, not spirits.

The sources analyse alcohol consumption mostly in Europe and different regions which would allow comparing the results between the countries. A restriction is that several of the data is collected at different years. Alcohol policies change over time and differently in various countries. This reason could cause errors when comparing them. Few of the researches are really

similar to the one which is conducted here and this provides information how to create it because they have already run into few errors which this research can avoid.

2. Empirical part

2.1. Overview of data and methods

The data for this research paper is collected from my supervisor, Viktor Trasberg. The surveys were led by two Washington DC based organizations, International Alliance for Responsible Drinking (IARD) and International Center for Alcohol Policies (ICAP), and carried on by Research Gate. The questionnaire was cross-sectional and representative population samples were used. The respondents were acquired through door-to-door visits and face-to-face interviews were conducted. The questionnaire was created by earlier questionnaires conducted by IARD and was redone by experts. Trasberg has access to the data as he helped them to conduct it. The data has observants from all the Baltic States but as the research would expand too wide, only Estonia will be analysed. The data sample contains answers from 1250 people from Estonia. The data was gathered through 2015 and 2016. The variables include income, education, professional status, age, gender, region of living, type of alcohol consumed, quantity of alcohol consumed, frequency of consumption and few more. In the survey there are 3 alcohol types – beer, wine and spirits. The pure alcohol is calculated by the following formula:

Alcohol units = Quantity (litres) x ABV (%) x 0,789 ("Alkoholiühik", n.d.)

For calculating the alcohol units, the ABV for beer is 4.5%, 13% for wine and 40% for spirits. The quantities are 0.5L for beer, 0.16L for wine and 0.04L for spirits. For every type of drink the alcohol units are calculated and then multiplied by 10 because one unit of alcohol is equal to 10ml of pure alcohol. That amount is multiplied by the number of drinks for each type of

drinker. Light drinker drinks less or equal to 1 drink per day, moderate drinker drinks over 1 and less or equal to 2 drinks per day and heavy drinker has more than 2 drinks per day. The consumption will be measured annually, so it will be multiplied by 365 days. In order to get a standard amount, the pure alcohol the people consumed per year is multiplied by the number of people who drank a specific type of drink and then divided by the total amount of drinkers. Light drinkers consume up to 5.77 litres of pure alcohol per year, moderate drinkers consume up to 11.56 litres per year and heavy drinkers consume more than 11.56 litres per year. Education is divided into three categories – primary, secondary and higher. Primary education contains respondents who have studied up to 9 years. People who have studied up to 12 years belong to the secondary education and higher group contains people who have studied more than 12 years. The respondents are aged from 18 to 74. The ages are divided into four groups: 18-32, 33-46, 47-60 and 61-74. Underage people were not asked. This could create an error because some of them could answer incorrectly. Region of living is divided into two categories. One is rural or a small town and the second is city. Professional status has 3 groups – low status, medium status and high status. The income is divided into 3 groups – low income, medium income and high income. These are taken on annual basis. The frequency of alcohol consumption is divided into three groups – once per month, few times per month and several times per week. Gender consists of male and female.

Using SPSS, statistical analyses will be created to find relations between alcohol consumption and socioeconomic factors. Total pure alcohol consumption is taken as the dependent variable. An overview of the data is given which conveys the frequencies and percentages of different factors. When conducting ordinal regression then the factors will be the region of living, gender and professional status. The covariates will be income, education, age

and consumption frequency. The regression will be unrevealing the Odd Ratios (OR). In the beginning descriptive, frequencies and crosstabs table will be made in order to uncover the basics of the variables. Descriptive table reveals how large of a sample size will be used because there are some missing values. Crosstabs conveys what are the relationships between alcohol consumption and a specific independent variable. Chi-Square Tests and Symmetric Measures also states which of these are significant. MANOVA is used to find the effects between the variables.

2.2. Interpretation and recommendation for alcohol policy design in Estonia

Before starting to create a regression model and other tests, statistics of the variables is made to have an overview of the data. Annual consumption is missing 233 values (see Table 3) which are 18.64% of the total sample size. These arise from the respondents who are non-drinkers or who have not responded to their drinking amounts. As these values are grouped then it is better to look at the mode than mean. The most people belong to the light drinker group. The mean of gender is 0.48 which means that more respondents belong to group 1 which is female. Location's mean is 0.5 which conveys that the people are divided between rural area and urban area very well. Annual income is missing 138 values. These can arise from the fact that people are not earning an income or have not responded. The mode for the variable is 2. This means that most people belong to medium income group rather than low or high income. The most popular group within age is 33-46. Education consists of 3 missing values. These can arise from the fact that respondents did not want to share that information or did not understand where they belong. It is unlikely that the respondents have no education because primary education is mandatory to acquire in Estonia. The most popular group is secondary education. Consumption frequency has

the same amount of missing values as annual consumption. The people who drink some quantities have also responded how frequently they drink. The same reasons why there are missing values concerning consumption quantity can be applied to consumption frequency. The most popular group is drinking once per month. Professional status has 95 missing values. These can arise from the fact that respondents do not have jobs, prefer not to share that information or do not understand where they belong. The most popular group is medium status.

Table 3

Statistics of the variables

	N		Mean	Std. Error of Mean	Mode	Std. Deviation	Min	Max
	Valid	Missing						
Consumption quantity	1017	233	13,491	,02176	1,00	,69382	1,00	3,00
Gender	1250	0	,48	,014	0	,500	0	1
Location	1250	0	,50	,014	1	,500	0	1
Income	1112	138	19,317	,02295	2,00	,76537	1,00	3,00
Age	1250	0	24,392	,03028	2,00	107,071	1,00	4,00
Education	1247	3	22,727	,01760	2,00	,62151	1,00	3,00
Consumption frequency	1017	233	16,372	,02076	1,00	,66190	1,00	3,00
Professional status	1155	95	18,840	,01789	2,00	,60790	1,00	3,00

Source: author's calculations

In order to understand how different independent variable groups relate to alcohol consumption quantity then crosstabs are made. As found before then alcohol consumption is missing 233 values. When the dependent variable is crossed with a specific independent variable then it is found that income together with consumption quantity is missing 328 values (See Appendix A). This means that 26.24% of the total sample size is missing. This is quite large loss. Education together with consumption quantity is missing 234 values. Professional status crossed with consumption quantity is missing 305 values which 24.4% of total sample size.

Chi-Square Tests and Symmetric Measures are conducted in order to find out the significance of the certain crosstabs. The p-values for gender, location, age, education, consumption frequency and professional status are significant (see Appendix B) because their p-values are less than 0.05. Income is the only variable which is not significant as its p-value is more than 0.05. This means that income's crosstab with consumption quantity will not be analysed.

Males and females have very similar sample size (see Table 4) which makes the comparison good. 22.6% of men are heavy drinkers which is 19.7% compared to women. On the other hand, 92% of women are light drinkers which is 28.7% more compared to men. Gmel et al. (2013) and Murphy et al. (2012) agree with this research by stating that men drink more than women. Murphy et al. (2012) also add that men have a tendency to drink in a harmful way.

Table 4

Crosstab for consumption quantity and gender

			Consumption quantity			
			Light drinker	Moderate drinker	Heavy drinker	Total
Gender	Female	Count	472	26	15	513
		% within Gender	92,0%	5,1%	2,9%	100,0%
	Male	Count	319	71	114	504
		% within Gender	63,3%	14,1%	22,6%	100,0%
Total		Count	791	97	129	1017
		% within Gender	77,8%	9,5%	12,7%	100,0%

Source: author's calculations

By looking at Table 5 it is seen that rural and urban areas have similar sample size which makes the comparison good. People living in the rural area consist 15.9% of heavy drinkers. This is 6.3% more compared to urban area. On the other hand, people living in urban area consist 81.5% of heavy drinkers which is 7.7% more compared to rural area. Helasoja et al. (2007)

contradicts this research by conveying that people living in urban areas drink more heavily. This research's focus is on one country but the latter authors focused on four different countries which can result in different results. Furthermore, the previous research was created in 2007 which is approximately a decade ago. During this time period consumers' preferences can change. People living in different countries might have a different urban-rural living ratio and it also depends on from where the sample is gathered from. For example, when snowballing effect is used then the network might be limited more to one area of living.

Table 5

Crosstab for consumption quantity and location

			Consumption quantity			Total
			Light drinker	Moderate drinker	Heavy drinker	
Location	Rural	Count	367	51	79	497
		% within Location	73,8%	10,3%	15,9%	100,0%
	Urban	Count	424	46	50	520
		% within Location	81,5%	8,8%	9,6%	100,0%
Total		Count	791	97	129	1017
		% within Location	77,8%	9,5%	12,7%	100,0%

Source: author's calculations

By looking at Table 6 it is seen that age has similar sample sizes which makes the comparison good, although the fourth group has a smaller sample size compared to the other groups. The age group 47-60 contains 15% of heavy drinkers which is 1.1% more than 33-46, 4.2% more than 18-32 and 4.8% more than 61-74. The latter age group contains 85.2% of light drinkers which is 5.1% more than 18-32, 10% more than 47-60 and 11.9% more than 33-46. Ahlström, Bloomfield & Knibbe (2001)**,** McKee et al. (2000), Mäkelä et al. (2001), Murphy et al. (2012) and Helasoja et al. (2007) found that younger people tend to drink more. Their statement contradicts the statement made in this research as in case of Estonia, the youngest and

the oldest age groups tend to have less heavy drinkers. The middle groups are rather the ones where more heavy drinkers belong. Helasoja et al. (2007) also found that young women tend to binge drink and Kluumbiene et al. (2012) add that they tend to drink frequently beer or wine. The people who are anged 33-46 and 47-60 might be in an age where the income is higher compared to the groups 18-32 and 61-74. The oldest group contains people who belong to retirement age and the youngest group contains people who might not have started working yet and are still studying.

Table 6

Crosstab for consumption quantity and age

			Consumption quantity			Total
			Light drinker	Moderate drinker	Heavy drinker	
Age	18-32	Count	201	23	27	251
		% within Age	80,1%	9,2%	10,8%	100,0%
	33-46	Count	217	38	41	296
		% within Age	73,3%	12,8%	13,9%	100,0%
	47-60	Count	206	27	41	274
		% within Age	75,2%	9,9%	15,0%	100,0%
	61-74	Count	167	9	20	196
		% within Age	85,2%	4,6%	10,2%	100,0%
Total		Count	791	97	129	1017
		% within Age	77,8%	9,5%	12,7%	100,0%

Source: author's calculations

Education sample sizes are very different compared to each other (see Table 7). In order to get better results, the sample sizes should be more equal. Primary education consists 20% of heavy drinkers which is 6.1% more compared to secondary education and 10.6% more compared to higher education. Higher education consists 80.4% of light drinkers which is 4% more compared to secondary education and 6% more compared to primary education. Helasoja et al. (2007) contradicts this research by stating that in most of the countries analysed, heavy drinking

took place among better educated. On the other hand, Ahlström, Bloomfield & Knibbe (2001) and Kluumbiene et al. (2012) specify that only women with higher education tend to drink more. Per contra, McKee et al. (2000) and Murphy et al. (2012) discovered that men who are highly educated drink heavily, not women. Helasoja et al. (2007) also shared the fact that men with lower education binge drink more. This research and previous researches contradict with the relation between consumption quantity and education level. The higher educated people might be heavier drinkers because their education helped them to acquire a professional status where larger income is earned.

Table 7

Crosstab for consumption quantity and education

			Consumption quantity			Total
			Light drinker	Moderate drinker	Heavy drinker	
Education	Primary	Count	67	5	18	90
		% within Education	74,4%	5,6%	20,0%	100,0%
	Secondary	Count	407	52	74	533
		% within Education	76,4%	9,8%	13,9%	100,0%
	Higher	Count	316	40	37	393
		% within Education	80,4%	10,2%	9,4%	100,0%
Total		Count	790	97	129	1016
		% within Education	77,8%	9,5%	12,7%	100,0%

Source: author's calculations

By looking at Table 8 it is seen that the group "several times per week" has much smaller sample size which could lead to less accurate results. 75.2% of people who drink several times per week are heavy drinkers which are 64% more compared to the people who consume alcohol few times per week and 75% more compared to the people who drink once per month. 99.2% of people who drink once per month are light drinkers. This is 27.5% more compared to people who

drink few times per month and 92.5% more compared to the people who drink several times per week.

Table 8

Crosstab for consumption quantity and consumption frequency

			Consumption quantity			Total
			Light drinker	Moderate drinker	Heavy drinker	
Consumption frequency	once per month	Count	470	3	1	474
		% within Consumption frequency	99,2%	0,6%	0,2%	100,0%
	few times per month	Count	314	75	49	438
		% within Consumption frequency	71,7%	17,1%	11,2%	100,0%
	several times per week	Count	7	19	79	105
		% within Consumption frequency	6,7%	18,1%	75,2%	100,0%
Total		Count	791	97	129	1017
		% within Consumption frequency	77,8%	9,5%	12,7%	100,0%

Source: author's calculations

The sample sizes of the professional status groups are very different (see Table 9) which might result in less accurate results. 18% of low professional status consists of heavy drinkers which is 6.5% more compared to high status and 7% more compared to the medium status. 80.6% of medium status consists of light drinkers which is 3.7% more compared to high status and is 11% more compared to low status. Low professional status can be related to primary education because with lower education lower status positions might be more likely.

Table 9

Crosstab for consumption quantity and professional status

			Consumption quantity			Total
			Light drinker	Moderate drinker	Heavy drinker	
Professional status	Low status	Count	151	27	39	217
		% within Professional status	69,6%	12,4%	18,0%	100,0%
	Medium status	Count	482	50	66	598
		% within Professional status	80,6%	8,4%	11,0%	100,0%
	High status	Count	100	15	15	130
		% within Professional status	76,9%	11,5%	11,5%	100,0%
Total		Count	733	92	120	945
		% within Professional status	77,6%	9,7%	12,7%	100,0%

Source: author's calculations

The Spearman's rho correlation is used to find significant relationships between the dependent variable and independent variables. In this case gender, location and consumption frequency have significant correlation values at the level 0.01 (see Table 10) and professional status has significant correlation value at the level 0.05. For gender the correlation is 0.351 which is positive weak correlation. This shows that as the consumption quantity increases then the values tend to move towards male as male is 0. The correlation for location is -0.097 is a very weak negative correlation. This shows that the when alcohol quantity increases then the values tend to move towards rural area as it is grouped as 0. The correlation consumption frequency is 0.601 which is moderate positive correlation. As the consumption quantity goes up, so does the consumption frequency. The correlation for professional status is -0.076 which is a very weak negative correlation which shows that as the consumption size increases then the values tend to go to lower status.

Table 10

Correlations between consumption quantity and independent variables

	Spearman's rho		
	Consumption quantity		
	Correlation Coefficient	Sig. (2-tailed)	N
Consumption quantity	1,000	.	1017
Gender	,351**	,000	1017
Location	-,097**	,002	1017
Income	-,003	,926	922
Age	-,028	,380	1017
Education	-,061	,052	1016
Consumption frequency	,601**	,000	1017
Professional status	-,076*	,019	945

Notes. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Source: author's calculations

In order to find interaction effects between variables, MANOVA is conducted. By looking at Box's Test of Equality of Covariance Matrices (Appendix C), it is seen that the p-value > 0.05 which means that the dependent variables are equal across the groups. By looking at the Multivariate Tests (Appendix D), it is seen that Wilks' Lambda $p < 0.05$ means that the socioeconomic status the respondents have is dependent on alcohol consumption. 24.5% if variability is accounted for by the dependent variables. The homogeneity assumption is not being satisfied in the case of area of living, age, consumption frequency and professional status because the p-value is less than 0.05 (See Appendix E).

The significant dependent variables are location and consumption frequency as their p-value is smaller than 0.05 (see Table 11). This means that these two variables have statistically significant effect on consumption quantity. By looking at the Multiple Comparisons (Appendix

F), it is seen that still only location and consumption frequency show significant values considering alcohol consumption quantity different types.

Table 11

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Consumption quantity	Location	2,477	2	1,239	4,995	,007	,011
	Income	,074	2	,037	,063	,939	,000
	Age	4,402	2	2,201	1,990	,137	,005
	Education	1,319	2	,660	1,740	,176	,004
	Consumption frequency	157,266	2	78,633	300,271	,000	,411
	Professional status	1,463	2	,731	2,094	,124	,005

Source: author's calculations

The final model gives better results when just guessing the probabilities as the p-value is 0 (Appendix G). In other words, the model fits the data well. On the other hand, large values of -2 Log Likelihood convey that the model fits poorly. In this case the values are little bit too large but nothing to worry about. The Chi-Square is the difference between the initial and final model. 468.883 indicates a large difference which shows that the final model fits poorly. The deviance value is larger than 0.05 (Appendix H) which means that the model fits the data well. The large Chi-Square value conveys that there is much unexplained variation in the logistic regression model – the higher the value the less accurate the model. It compares the difference in probability between the predicted outcome and the actual outcome for each case and sums these differences together to provide a measure of the total error in the model. By looking at Appendix I, it is seen that the Nagelkerke value is 56%. This conveys that variance in the outcome is explained by explanatory variables. This percentage is rather good as over half of the outcome is explained by the variables. The p-value of 0.562 (Appendix J) indicates that the model fits the data well. That odds for each explanatory variables are consistent across different thresholds.

Odd Ratios (OR) are found by taking the exponent of a location estimate. In case of income, age, education and consumption frequency, the estimates have to be first multiplied by the number of groups they have and then take the exponent of it. For education, location and professional status, the p-value is not signficant. Therefore, these will not be analysed. OR for income is 0.34 (see Table 12) which means that the odds for being a heavy drinker for high income people is approximately one-third compared to low income people.

Table 12

Parameter Estimates between alcohol consumption and independent variables

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Consumption quantity = 1,00]	5,221	,756	47,700	1	,000	3,740	6,703
	[Consumption quantity = 2,00]	6,495	,782	68,910	1	,000	4,962	8,029
Location	Income	-,358	,157	5,174	1	,023	-,666	-,050
	Age	-,248	,103	5,771	1	,016	-,451	-,046
	Education	-,215	,196	1,199	1	,273	-,599	,170
	Consumption frequency	3,214	,240	178,900	1	,000	2,743	3,684
	[gender=0]	-1,431	,248	33,388	1	,000	-1,917	-,946
	[gender=1]	0a	.	.	0	.	.	.
	[Location =0]	,001	,219	,000	1	,997	-,429	,430
	[Location =1]	0a	.	.	0	.	.	.
	[Professional status=1,00]	,451	,373	1,464	1	,226	-,280	1,181
	[Professional status=2,00]	,019	,308	,004	1	,951	-,584	,622
	[Professional status=3,00]	0a	.	.	0	.	.	.

Source: author's calculations

The OR for age is 0.37 which conveys that the odds for being a heavy drinker for older age is approximately one-third compared to younger people. The OR for consumption frequency is 15398.11 which means that there is 15398.11 times more chance of being a heavy drinker when alcohol is consumed several times per week rather than when alcohol is consumed once per month. The OR for women is 0.24 which means that women are little bit more than 4 times less likely to be heavy drinkers. Vice versa, men are over 4 times more likely to be heavy drinkers.

Some of the results are little bit different as expected compared to previous studies. The sample size consists of manifold missing values, which means that the analysed sample is reduced. In order to make a better model then a larger sample size should be acquired with less missing values. Furthermore, some of the variables should have more equally distributed sample sizes in order to get better results. In the case of this research then it was not possible to alter the groups' parameters because the model would not make any sense then. From the crosstabs it is found that among men there are more heavy drinkers than amongst women (see Table 13). Previous sources also support this statement. Women are more than 4 times less likely to be heavy drinkers. Rural area consists of more heavy drinkers than urban area. Helasoja et al. (2007) contradicts this research by conveying that people living in urban areas drink more heavily. People positioned in the two middle age groups consist of more heavy drinkers than the youngest age group or the oldest age group. The odds for being a heavy drinker for older age is approximately one-third compared to younger people. Other sources contradict this statement as Ahlström, Bloomfield & Knibbe (2001), McKee et al. (2000), Mäkelä et al. (2001), Murphy et al. (2012) and Helasoja et al. (2007) found that younger people tend to drink more. Helasoja et

al. (2007) also found that young women tend to binge drink and Kluumbiene et al. (2012) add that they tend to drink frequently beer or wine.

Table 13

Findings of alcohol consumption quantity

	Crosstabs	Odd Ratios
Gender	Men drink more heavily than women	Men are over 4 times more likely to be heavy drinkers
Location	Rural areas have more heavy drinkers than urban	
Income		The odds for being a heavy drinker for high income people is approximately one-third compared to low income people
Age	47-60 aged people consist of more heavy drinkers than younger or older people	The odds for being a heavy drinker for older age is approximately one-third compared to younger people
Education	People with primary education are more likely to be heavy drinkers than people with secondary or higher education	
Consumption frequency	People who drink several times per week are highly likely to become heavy drinkers	There is 15398.11 times more chance of being a heavy drinker when alcohol is consumed several times per week rather than when alcohol is consumed once per month
Professional status	Low professional status consist more heavy drinkers than people with medium or high status jobs	

Source: author's calculations

Primary education people have more heavy drinkers than secondary or higher education people. Helasoja et al. (2007) contradicts this statement by stating that in most of the countries analysed, heavy drinking took place among better educated. On the other hand, Ahlström, Bloomfield & Knibbe (2001) and Kluumbiene et al. (2012) specify that only women with higher

education tend to drink more. Per contra, McKee et al. (2000) and Murphy et al. (2012) discovered that men who are highly educated drink heavily, not women. People who consume alcohol several times per week consists more heavy drinkers than people who drink once per month. There is 15398.11 times more chance of being a heavy drinker when alcohol is consumed several times per week rather than when alcohol is consumed once per month. Low professional status has more heavy drinkers then people with higher professional status. The odds for being a heavy drinker for high income people is approximately one-third compared to low income people.

Conclusion

Some previous studies found that low socioeconomic status is associated with bigger consumption and other found that high socioeconomic status is related to large alcohol consumption. Based on the research made, it can be said that a person with a low socioeconomic status in Estonia drinks more. It was found that respondents, who have primary education or have low professional status consist more heavy drinkers than do people with higher education or professional status. The odds for being a heavy drinker for high income people is one-third compared to low income people. The research also shows that men's odds are four times higher of becoming a heavy drinker compared to women. Location of living showed contradictions as other sources stated that there are more heavy drinkers in urban areas but this research showed that there are more heavy drinkers in rural areas. Previous sources brought out that younger people tend to drink more than older people. Per contra, this research conveys that age group 47-60 shows to have the most people who are heavy drinkers. People who consume alcohol several times per week have 75% of being heavy drinkers.

Some of the results are different when compared to previous studies and this could be for several reasons. The sample size consists of manifold missing values, which means that the analysed sample is reduced and can lead to large inaccuracy. In order to make a better model then a larger sample size should be acquired with less missing values. Furthermore, some of the variables should have more equally distributed sample sizes in order to get better results. Most of the respondents belong to the light drinker group but the better understand different types of drinkers then moderate drinker and heavy drinker sample sizes should also be bigger. In the case of this research then it was not possible to alter the groups' parameters because the model would not make any sense then. The drinking types' groups cannot be edited because otherwise, the different groups would include invalid data. As in Estonia low socioeconomic status people are more likely to be heavy drinkers than high socioeconomic status people then the excise duty tax should be increased in order to decrease the low socioeconomic status people's consumption. This research results are based on 2015-16 data and the recommendation made has already been undertaken the government. In order to find out how the alcohol consumption changes considering people's socioeconomic status then a research has to be made based on data which is collected after the excise duty change.

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Appendices

Appendix A

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * Consumption quantity	1017	81,4%	233	18,6%	1250	100,0%
Location * Consumption quantity	1017	81,4%	233	18,6%	1250	100,0%
Income * Consumption quantity	922	73,8%	328	26,2%	1250	100,0%
Age * Consumption quantity	1017	81,4%	233	18,6%	1250	100,0%
Education * Consumption quantity	1016	81,3%	234	18,7%	1250	100,0%
Consumption frequency * Consumption quantity	1017	81,4%	233	18,6%	1250	100,0%
Professional status * Consumption quantity	945	75,6%	305	24,4%	1250	100,0%

Source: author's calculations

Appendix B

Chi-Square Tests and Symmetric Measures

		Value	Sig.
Gender	Pearson Chi-Square	126,377	,000
	Phi	,353	,000
	Cramer's V	,353	,000
Location	Pearson Chi-Square	10,370	,006
	Phi	,101	,006
	Cramer's V	,101	,006
Income	Pearson Chi-Square	4,541	,338
	Phi	,070	,338
	Cramer's V	,050	,338
Age	Pearson Chi-Square	14,155	,028
	Phi	,118	,028
	Cramer's V	,083	,028
Education	Pearson Chi-Square	10,012	,040
	Phi	,099	,040
	Cramer's V	,070	,040
Consumption frequency	Pearson Chi-Square	554,927	,000
	Phi	,739	,000

	Cramer's V	,522	,000
	Pearson Chi-Square	11,918	,018
	Phi	,112	,018
Professional status	Cramer's V	,079	,018

Source: author's calculations

Appendix C

Box's Test of Equality of Covariance Matrices

Box's M	53,420
F	1,243
df1	42
df2	177,847,447
Sig.	,135

Source: Compiled by the author

Appendix D

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Consumption quantity	Wilks' Lambda	,570	46,277b	12,000	1,712,000	,000	,245

Notes. b. Exact statistic

Source: Compiled by the author

Appendix E

Levene's Test of Equality of Error Variances

		Levene Statistic	df1	df2	Sig.
Location	Based on Mean	17,799	2	861	,000
Income	Based on Mean	2,092	2	861	,124
Age	Based on Mean	6,584	2	861	,001
Education	Based on Mean	1,517	2	861	,220

Consumption frequency	Based on Mean	24,289	2	861	,000
Professional status	Based on Mean	6,473	2	861	,002

Source: author's calculations

Appendix F

Multiple Comparisons (LSD)

Dependent Variable	(I) Consumption quantity	(J) Consumption quantity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Location	Light drinker	Moderate drinker	,08	,058	,178	-,04	,19
		Heavy drinker	,15*	,051	,003	,05	,25
	Moderate drinker	Light drinker	-,08	,058	,178	-,19	,04
		Heavy drinker	,07	,072	,304	-,07	,22
	Heavy drinker	Light drinker	-,15*	,051	,003	-,25	-,05
		Moderate drinker	-,07	,072	,304	-,22	,07
Income	Light drinker	Moderate drinker	,0242	,08943	,786	-,1513	,1998
		Heavy drinker	-,0151	,07816	,847	-,1685	,1383
	Moderate drinker	Light drinker	-,0242	,08943	,786	-,1998	,1513
		Heavy drinker	-,0393	,11109	,723	-,2574	,1787
	Heavy drinker	Light drinker	,0151	,07816	,847	-,1383	,1685
		Moderate drinker	,0393	,11109	,723	-,1787	,2574
Age	Light drinker	Moderate drinker	,2395	,12240	,051	-,0007	,4797
		Heavy drinker	,0677	,10697	,527	-,1422	,2777
	Moderate drinker	Light drinker	-,2395	,12240	,051	-,4797	,0007

		Heavy drinker	-,1718	,1520 3	,259	-,4702	,1266
		Light drinker	-,0677	,1069 7	,527	-,2777	,1422
	Heavy drinker	Moderate drinker	,1718	,1520 3	,259	-,1266	,4702
		Moderate drinker	,0102	,0716 6	,887	-,1305	,1508
	Light drinker	Heavy drinker	,1167	,0626 3	,063	-,0062	,2396
		Light drinker	-,0102	,0716 6	,887	-,1508	,1305
	Moderate drinker	Heavy drinker	,1065	,0890 1	,232	-,0682	,2812
		Light drinker	-,1167	,0626 3	,063	-,2396	,0062
	Heavy drinker	Moderate drinker	-,1065	,0890 1	,232	-,2812	,0682
Education		Moderate drinker	-,7691*	,0595 6	,000	-,8860	-,6522
	Light drinker	Heavy drinker	-1,1604*	,0520 5	,000	-12,626	-10,583
		Light drinker	,7691*	,0595 6	,000	,6522	,8860
	Moderate drinker	Heavy drinker	-,3913*	,0739 8	,000	-,5365	-,2461
		Light drinker	1,1604*	,0520 5	,000	10,583	12,626
Consumption frequency	Heavy drinker	Moderate drinker	,3913*	,0739 8	,000	,2461	,5365
		Moderate drinker	,0652	,0687 9	,343	-,0698	,2002
	Light drinker	Heavy drinker	,1153	,0601 2	,055	-,0026	,2333
		Light drinker	-,0652	,0687 9	,343	-,2002	,0698
	Moderate drinker	Heavy drinker	,0501	,0854 4	,558	-,1176	,2178
		Light drinker	-,1153	,0601 2	,055	-,2333	,0026
Professional status	Heavy drinker	Moderate drinker	-,0501	,0854 4	,558	-,2178	,1176

Source: Compiled by the author

Appendix G

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1,003,420			
Final	534,537	468,883	8	,000

Source: Compiled by the author

Appendix H

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	1,021,535	782	,000
Deviance	414,396	782	1,000

Source: Compiled by the author

Appendix I

Pseudo R-Square

Cox and Snell	,419
Nagelkerke	,560
McFadden	,393

Source: Compiled by the author

Appendix J

Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	534,537			
General	527,767	6,770	8	,562

Source: Compiled by the author

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